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File: DWPI

Jan 22, 1999

DERWENT-ACC-NO: 1999-159756

DERWENT-WEEK: 199914

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TITLE: Gallium-nitride semiconductor laser - includes resonator with gallium nitride end face surface formed perpendicular to substrate surface

PATENT-ASSIGNEE: NEC CORP (NIDE)

PRIORITY-DATA: 1997JP-0162717 (June 19, 1997)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 11017275 A	January 22, 1999		008	H01S003/18

## APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP11017275A	June 19, 1997	1997JP-0162717	

INT-CL (IPC): H01L 33/00; H01S 3/18

ABSTRACTED-PUB-NO: JP11017275A

## BASIC-ABSTRACT:

NOVELTY - A sapphire substrate (101) is provided on which a buffer layer (602) and a contact layer (603) are formed. A silicon (102) is formed on the contact layer. A resonator (103) is formed on the silicon nitride mask. The end face of the resonator is constituted by gallium-nitride group semiconductor surface (11-20) which is formed perpendicular to substrate surface.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for gallium-nitride group semiconductor laser manufacturing method.

USE - None given.

ADVANTAGE - Since end face has plane accuracy of number atomic layer, it can materialize superior threshold current and oscillation efficiency. Extremely flat and superior resonator mirror is formed on parallelism with simple process.

DESCRIPTION OF DRAWING(S) - The figure depicts the sectional view showing structure of gallium-nitride group laser. (11-20) Semiconductor substrate; (101) Sapphire substrate; (102) Silicon nitride mask; (103) Resonator; (104) Gallium-nitride group semiconductor layer; (602) Buffer layer; (603) Contact layer.

ABSTRACTED-PUB-NO: JP11017275A

## EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.1/7

DERWENT-CLASS: L03 U12 V08

CPI-CODES: L04-A02;

EPI-CODES: U12-A01B1B; U12-A01B6; V08-A01A; V08-A01D; V08-A04A;

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File: JPAB

Apr 13, 1999

PUB-NO: JP411103133A

DOCUMENT-IDENTIFIER: JP 11103133 A

TITLE: SEMICONDUCTOR LAYER USING SELECTIVE GROWTH METHOD AND ITS GROWTH METHOD,  
NITRIDE-BASED SEMICONDUCTOR LAYER USING SELECTIVE GROWTH METHOD AND ITS GROWTH  
METHOD AS WELL AS NITRIDE-BASED SEMICONDUCTOR LI

PUBN-DATE: April 13, 1999

## INVENTOR-INFORMATION:

NAME

COUNTRY

KIMURA, AKITAKA

## ASSIGNEE-INFORMATION:

NAME

COUNTRY

NEC CORP

APPL-NO: JP09264225

APPL-DATE: September 29, 1997

INT-CL (IPC): H01S 3/18; H01L 33/00

## ABSTRACT:

PROBLEM TO BE SOLVED: To prevent an opening part from being expanded, by a method wherein a second- conductivity nitride-based semiconductor layer is grown selectively, at a temperature which is higher than the decomposition temperature of a mask material, in the opening part in which a mask is formed of a material which changes the second-conductivity nitride-based semiconductor layer into a first-conductivity nitride-based semiconductor layer, and a part of the constituent element of the mask material is made identical to a part of the constituent element of the second-conductivity nitride-based semiconductor layer.

SOLUTION: A P-type gallium nitride contact layer 11 is formed by a selective growth method in which a silicon nitride film 216 is used as a mask. At this time, ammonia as a group V raw material is decomposed in an atmosphere at about 1000°C or higher, and a nitrogen partial pressure in a vapor phase exists. As a result, the desorption of N from the silicon nitride film 216 and the adsorption of N to the silicon nitride film 216 are in equilibrium. Even when the P-type gallium nitride contact layer 111 is formed at a high temperature of 1050°C, it is possible to restrain the silicon nitride film 216 from being decomposed. Consequently, while the contact layer 11 is being formed, it is possible to prevent that the silicon nitride film 216 is retreated and that an opening part is expanded. Consequently, it is possible to prevent that the silicon which is generated by the decomposition of the silicon nitride film 216 is deposited in a regrowth interface so as to be taken into the P-type gallium nitride contact layer 111.

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USPT,PGPB,JPAB,EPAB,DWPI,TDBD	silicon adj nitride	76005	<u>L1</u>